Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

But

$$\cot x = \frac{1}{x} - \frac{x}{3} - \frac{x^3}{45} - \frac{2x^5}{945} - \cdots.$$

Hence,

$$\frac{d}{dx}\log\,[(\sin x)/x] = -\frac{x}{3} - \frac{x^3}{45} - \frac{2x^5}{945} - \cdots$$

from which by integration, we get

$$\log\,[(\sin x)/x] = -\frac{x^2}{6} - \frac{x^4}{180} - \frac{x^6}{2835} - \cdots$$

A solution similar to I was received from LEVY M. COFFIN.

GEOMETRY.

423. Proposed by C. N. SCHMALL, New York City.

The sum of the squares of the distances of a point from n fixed points is constant. Show that the locus of the point is a circle.

SOLUTION BY W. C. EELLS, Tacoma, Wash.

Let (x_1, y_1), (x_2, y_2) $\cdots$ (x_n, y_n) be the coördinates of the n fixed points, and (x, y) of the moving point. Since $d_i = \sqrt{(x - x_i)^2 + (y - y_i)^2}$, the given condition may be expressed,

$$(x - x_1)^2 + (y - y_1)^2 + (x - x_2)^2 + (y - y_2)^2 + \cdots + (x - x_n)^2 + (y - y_n)^2 = k,$$

which reduces to

$$nx^2 + ny^2 - 2(x_1 + x_2 + \cdots + x_n)x - 2(y_1 + y_2 + \cdots + y_n)y$$
$$+ (x_1^2 + x_2^2 + \cdots + x_n^2) + (y_1^2 + y_2^2 + \cdots + y_n^2) - k = 0.$$

This may be expressed more briefly,

$$x^2 + y^2 - \left(\frac{2}{n}\sum_{i=1}^{n} x_i\right)x - \left(\frac{2}{n}\sum_{i=1}^{n} y_i\right)y + \frac{1}{n}\left(\sum_{i=1}^{n} x_i^2 + \sum_{i=1}^{n} y_i^2 - k\right) = 0.$$

This is a circle, with center at $\left(\frac{1}{n}\sum_{i=1}^{n} x_i, \frac{1}{n}\sum_{i=1}^{n} y_i\right)$, the square of whose radius is

$$\left(\frac{1}{n}\sum_{i=1}^{n} x_i\right)^2 + \left(\frac{1}{n}\sum_{i=1}^{n} y_i\right)^2 - \frac{1}{n}\left(\sum_{i=1}^{n} x_i^2 + \sum_{i=1}^{n} y_i^2 - k\right).$$

Similar solutions were received from H. C. FEEMSTER, S. W. REAVES, F. M. MORGAN, ELMER SCHUYLER, and C. N. SCHMALL.

A solution of 418 was received from D. F. KELLEY; one of 420 from C. N. SCHMALL, and one of 422 from H. E. TREFETHEN, after the list of solutions was made up and sent to the printer.

CALCULUS.

327. Proposed by RICHARD P. LOCHNER, Philadelphia, Penn.

A hound is at the middle point of the side of a square field, and a fox is at an adjacent corner. How far will the hound run to catch the fox if the fox runs on the perimeter of the field and the hound runs directly towards the fox at all times, the hound running n times as fast as the fox? Where will the race end?